SIEMENS

FLUOROSPOT H/HK

AX

Maintenance Protocol

Customer:

Department: **Room:**

Address:

Contact person: **Telephone:**

Cust. specific no.:   **Customer no:**

The Maintenance Instructions
RX41-020.101.04.01.02
are required for this protocol

SIEMENS office:

Address:

Region: Country:

Contact person: Telephone:

FSE in charge: Telephone:

Information regarding the maintenance protocol

The maintenance protocol serves as a quality record of the maintenance performed

Maintenance must be performed in the prescribed intervals.

The maintenance results must be entered in the maintenance protocol.

The page numbers in the check list at the end of the protocol refer to the corresponding pages in the associated maintenance instructions (refer to the cover sheet).

The maintenance protocol must be completely filled out by the FSE in charge.

In other words,

- All fields must be completed. If a field does not apply to the system or if there is no information to be entered, enter 'n.a. ' in the field.

- The customer number must be entered in the header of every page (CS No.) so that every page is assigned to a customer.

- In case of complaints, enter the product identification (IVK = WE) for the component as well as the type of complaint in the 'Open items' table provided. Record the open items in the table with the date and signature. Correction of these open points should also be documented in this table along with the date and signature. If there are no open points, draw a line through the entire table and enter the date/initials.

- Enter the values measured during the maintenance in the space / table provided.

- After completing the maintenance, fill out page 3 of the protocol and sign it.

Processing and archiving the maintenance protocol:

The maintenance protocol is considered a record and must be archived. It must be filed after completion of maintenance in the corresponding Register of the Maintenance binder. If necessary, a copy should be distributed to the customer.

Maintenance Protocol

CS No.: . . . .

System Status:

System: Ser. No.:

Software Version:

Maintenance contract no.:

Type of contract:

The equipment has no problems Results of the image quality test showed no deviations from the required reference values.	☐
The equipment has minor problems that do not restrict its use. However they should be corrected as a preventive measure. Results of the image quality test showed no deviations from the required reference values.	☐
The equipment has major problems. For safety reasons, the equipment may not be used until the problem has been resolved.	☐

Location	
Date	
Name of the FSE	
Signature	

Maintenance Protocol

CS No.: . . . .

Performed tasks

	Date:		
Performed tasks:	OK	not OK	n.a.
	○	○	○
	○	○	○
	○	○	○
	○	○	○
	○	○	○
	○	○	○
	○	○	○
	○	○	○
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	○	○	○
	○	○	○

Open points

IVK (WE)	Component	Open points	Solved (Date)	FSE (Date)

Explanation of the acronyms:

Abbrev.	Explanation
SI	Safety Inspection
SIE	Safety Inspection Electrical Safety
SIM	Safety Inspection Mechanical Safety
PM	Preventive Maintenance
PMP	Preventive Maintenance Preventive Parts Exchange, External Inspection, etc.
PMA	Preventive Maintenance Adjustments
PMF	Preventive Maintenance Function, Operating-Value Check
Q	Quality Check
QIQ	Quality Check Image
QSQ	Quality Check System
SW	Software Maintenance

Measurement devices

Please enter all measuring devices used for maintenance in the table.

Measurement Device	Type	Serial-No.	Date of use	Calibrated until
TV Dynamics Test				
Luminous intensity meter				

Image Quality Test

Indirect Dose Rate Control (IQ Chap. 4.1.2)

Full format, **all** control steps
Prefiltering: 2.1 mm precision radiation filter

Operating Conditions					Initial Values			Mainten.
					+		**-**	
Control step	Fluoro Progr. (nGy/s)	Curve	Zoom		- 1 kV - 10% mA	Act.	+ 1 kV + 10% mA	
Step 1 **Fluoro 1** Step 2				kV mA				
				kV mA				
Step 1 **Fluoro 2** Step 2				kV mA				
				kV mA				
Step 1 **Fluoro 3** Step 2				kV mA				
				kV mA				

Zoom formats, Fluoro 1, Step 1

I.I. Format / I.I.		Initial Values			Mainten.
		+		**-**	
		- 1 kV - 10% mA	Act	+ 1 kV + 10% mA	
Zoom 1	kV mA				
Zoom 2	kV mA				
Zoom 3	kV mA				

Remarks: _____

_____

Indirect Dose Control (IQ Chap. 8.1.) DR

Dose	kV	F/s	Scene	Focus	I.I. For-mat (cm)	Zoom Dose fac.	Initial Values Qg/n			Mainten.
							-	Act	+	
							- 15%		+ 15%	
100	70	1	10s	■						

DSA

Dose	kV	F/s	Scene	Focus	I.I. For-mat (cm)	Zoom Dose Fac.	Initial Values Qg/n			Mainten.
							-	Act	+	
							- 15%		+ 15%	
500	70	0.5	10s	■						

Remarks: _____

_____

Monitor Adjustment (IQ Chap.8.3)

DFR Test Images

Monitor			Initial Values (cd/m^2)			Mainten.
		Luminous intensity	-	Act	+	
Examination room	Live	black	0.7		0.9	
		white	240		280	
	Ref	black	0.7		0.9	
		white	240		280	
5% / 95% fields visible?			☐ yes ☐ no			☐ yes ☐ no
Control room	Live	black	0.7		0.9	
		white	240		280	
	Ref	black	0.7		0.9	
		white	240		280	
5% / 95% fields visible?			☐ yes ☐ no			☐ yes ☐ no

NOTICE	On SIMOMED monitors, switch off the ambient light sensor for the measurement!

Remarks: _____

_____

Dynamics Test with Fluoroscopy (IQ Chap. 5.8.1) with VIDEOMED SX

B/BA-Signal Amplitudes

Focus-I.I. distance (SID) = _____ cm   - with grid

I.I. format ☐ 22 cm; ☐ 23 cm; ☐ 27 cm; ☐ 28 cm   - Dynamics test (close to I.I.)
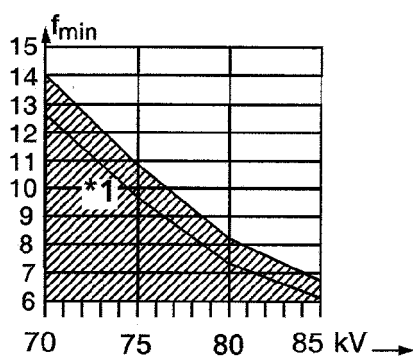
                                                    - without heart contour colli-
                                                      mator

                                                    - without capillary test

                                                    - B-Signal **without bias light**

Fluoro curve _____   ⊘| = _____ µGy/s

B-/BA-Signal (mV)	Field No.	Initial Values (mV)			Mainten.
		-	Act	+	
B-Signal	2L	—		—	
Input	1	65		95	
TV CCU	5R	—		—	
Fluoro dyn.					
BA-Signal	2L	≥ 1300		—	
Output	1	300		400	
TV CCU	5R	—		—	
Fluoro kV		—		—	

*1 Procedure with SIREGRAPH D2/D3/CF

Dynamics factor (f) = level/field 2L: level/field 1

Remarks: _____

_____

Dynamics Test with DR and DSA (IQ Chap.8.5)

CAUTION	**Do not select any additional filtering in the collimator**

DR: Dose 100, single image

Iris corr. values_____

DSA: Dose 200, F/s = 6, scene 5s

Iris corr. values_____

Focus-I.I. distance (SID) = _____ cm

- I.I. format ☐ 22 cm; ☐ 23 cm; ☐ 27 cm or ☐ 28 cm
- Dynamics test (close to I.I.)
- with heart contour collimator
- with capillary test
- with grid
  upper window value: W1 = 511
  lower window value: W2 = 256
- Measure BA-Signal at DFR output

Amplitudes

	Field No.	Initial Values (mV)			Mainten.
		-	Act	+	
DR BA-Signal (mV)	2L	520		620	
	1	200		250	
	5R	__		__	
DSA * BA-Signal (mV)	2L	__		< 650	
	1	190		260	
	5R	__		__	
U_a (kV)	DR	__	70	__	
	DSA	__	70	__	
U_{Iris} (V)	DR	__		__	
	DSA	__		__	

Reference values applicable for 70 kV

* Evaluate Native image (next to last image);
If 2L field would be > 650 mV, field 1 < 190 mV is admissible.

Remarks: _____

_____

Edge Enhancement (IQ Chap.8.5.2)

DR exposure

Function configured	Maintenance
yes	
no	

Remarks: _____

_____

Mean Value Calculation (GGM) (IQ Chap. 8.5.3)

Dig. Fluoro

Function configured	Maintenance
yes	
no	

Remarks: _____

_____

Resolution (IQ Chap. 8.7) and Minimum Contrast (IQ Chap. 8.8)

- 17 μm Cu strips
- With grid, ■
- Resolution test, Type 41 turned 45°
  and collimate to the test size
- Insert 1.2 mm Cu in the collimator
- E (%) = 0; temp. filter = 6%
- Fluoro 1 at fluoro (≈ 70 kV)
- Dose step 100 with DR (≈ 70 kV)
- Upper window value: W1 = 511; lower window value: W2 = 256

	Format	Initial Values (cd/m^2) (LP/mm)			Mainten.
		-	Act	+	
Min. contrast visible?		__	yes		
Dig. Fluoro ◎ 1	Full format			__	
	Zoom 1			__	
	Zoom 2			__	
	Zoom 3			__	
Min. contrast visible?		__	yes		
DR exposure	Full format			__	
	Zoom 1			__	
	Zoom 2			__	
	Zoom 3			__	
Min. contrast visible?		__	yes		
Hardcopy	Full format			__	
	Zoom 1			__	
	Zoom 2			__	
	Zoom 3			__	

Remarks: _____

_____

Check of the DSA Device (IQ Chap. 8.9)

Focus-I.I. distance (SID)= _____ cm

I.I. format ☐ 22 cm; ☐ 23 cm; ☐ 27 cm; ☐ 28 cm

Window values for DSA image: brightness W1 = 80; contrast: W2 = 220
- With grid
- E (%) = 0
- Dynamics test with heart contour collimator and capillary test 37 90 180
- Trigger a DSA scene: 6 F/s, Dose 200, scene 5s, 70 kV

Contrast Sensitivity			Initial Values			Maintenance *1		
			2L	1	5R	2L	1	5R
3 mm	16 %							
	4 %							
	0.75 %							
2 mm	10 %							
	3 %							
	2 %							
1 mm	7.5 %							
	4 %							
	2.5 %							

	Tolerance	n+2 -1	n	n - 3	LOG amplifier *2		
3 mm 16 %							
					Subtraction *3		
Tol. 0 ± 1							

*1 mark capillaries **not** visible
*2 Enter gray step of capillary
*3 Enter basic gray value of test field

Remarks: _____

_____

Image Disturbances (Artifacts) (Chap. 8.10)

DR Mode (Chap. 8.10.1)

Images from MP	Type of disturbance, Artifact		Initial Values	Mainten. *1
8.2	Pixel errors/	RAM		
8.5.1		POST PROCESSING		
8.5.1	Ghost images			
8.2 / 8.5.1	Contouring			
*2	Horizontal jitter			
8.2 / 8.5.1	Island formation			
8.4.3	Vignetting			

Other disturbances: _____

DSA Mode (IQ Chap. 8.10.2)

Images from MP	Type of Disturbance, Artifact		Initial Values	Mainten. *1
8.2	Pixel errors/	RAM		
8.5.1		POST PROCESSING		
8.9	Artifacts caused by exposure			
8.9	Logarithming errors			
8.9 / ***2**	Convergence errors			
8.9 / ***2**	Inhomogeneousness (Hum, Line Errors)			
8.9 / ***2**	Microphony			
8.9 / 8.2	Island formation			
8.9	Noise patterns			

Other disturbances: _____

*1   Enter No. 1, 2, 3
      1 = No disturbances, artifacts
      2 = Slight disturbances, artifacts
      3 = Intolerable disturbances, artifacts

*2   Soldering wire cross on middle of I.I.; 0.6 mm Cu prefilter

Digital Tomography (IQ Chap. 8.11)
- Tomo test object on tabletop
- Tomo height approx. 11.5 cm
  (depending on tomo test object)
- ■ , 0.6 mm Cu
- I.I. format 17 cm (20 cm)
- With grid
- Focus-I.I. distance (SID) = _____ cm
- Exposure voltage = _____ kV; Dose 100
- Tomo profile
- max. tomo angle: _____ °
- min. tomo time: _____ s

		Initial Values	Mainten.
* $\Delta S_{Ha} = S_{Ha} - S_H$ (mm)			
$\Delta S_{HL} = S_{HL} - S_H$ (mm)			
	Rg (LP/mm)		
Shape and sweep	/ o.k.		
	/ not o.k.		
Blur	/ o.k.		
	/ not o.k.		

*) Explanations

S_{Ha} = Displayed tomo height (≤ 5 mm)

S_H = Actual tomo height

S_{HL} = Light line height (≤ 5 mm)

Rg = Measured resolution (≥ 2.0)

Remarks:

_____

_____

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Maintenance Protocol   CS No.: . . . .